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If an excuse is needed for adding another to the already many papers on this subject, it will be found in the hostile position which all text-books, American, English, French, and German, hold towards it, and also in the importance of the subject.

From Agnew we learn that among the recruits, during the American war of the rebellion, 50 out of every 1,000 were rejected on account of hernia. Bryant tells us the rejections are, Germany, 82; Italy, 76; France, 65; England, 39; and Ireland 36 in every 1,000 recruits. Malgainge found that  $\frac{1}{8}$  of all the male, and  $\frac{1}{2}$  of all the female population of France were ruptured, or an average  $\frac{1}{6}$  for the whole population. That the number of the ruptured in the United States, in proportion to that of France is greater than what appears from the statistics of their respective recruits, is probably true, but working with the same proportion we find that there are more than 2,000,000 in our land. The two truss factories of Philadelphia, alone, sell, annually, about 240,000 trusses!

Mr. Keetly, of London, (B. M. J., December, 1885,) informs us that in the year 1878, the population of England and Wales was about 25,000,000, of which 1,150 died from hernia. The mortality in 1879 was only a little less, being 1,119. The same death-rate for the United States would give about 2,500 deaths yearly. Again, Mr. Keetly arrives at the conclusion "that of persons with hernia, and not subject to operative interference until there is an imperative need for it, an average of 1 in 20 will, sooner or later, die of hernia."

Hernia has probably existed as long as man has existed on the face of the earth, and ever since medicine has been a science, which according to Prof. Virchow, of Berlin, in some 3,000 years, or according to Dr. Grant Bey, of Cairo, Egypt, is 6,000 years, attempts have probably been made for its cure.

Anatomy had its birth in Egypt, where, during the embalming process, one would necessarily become more or less acquainted with the structures and arrangement of the internal organs of the human body; and though Celsus is the first surgeon who is known to have given a clear description of the coverings of the testicle, and also used means for the cure of inguinal hernia, such as bandages and the cautery, it is probable that he got his ideas from the Egyptians. Since the time of Celsus, various methods have been tried with greater or less success, many of the more barbarous of which are still practiced in Eastern countries. Ointments, poultices, and astringents were tried by charlatans. The actual cautery was applied over the external ring. Escharotics were used to the skin, or in some cases to the neck of the sac, after it was laid bare. Galen and Paulus Aegineta ligated sac, cord, and skin, together, at the external ring. Maupas operated by cutting through the rings and then sewing up. Castration was at one time very common, as was also pushing the testis up into the canal where it might become adherent. Ambrose Paré used the "point doré," which consisted in including sac, cord, and vessels in a wire ligature, with success, but this was frequently followed by atrophy of the testis. Freitag, of Zurich, appears to have modified this operation so as not to include the cord and vessels. The "royal suture" consisted in opening the sac and stitching the edges together. Petit and Leblanc operated on several cases as in strangulated hernia, but the mortality was so great that the operation was abandoned. Injections into the sac, of irritating substances, were practiced by Vepeau and Pancost, and sometimes with a fatal result. Belmas and Riggs introduced small pieces of sponge and gold-beaters skin into the sac, so as to set up adhesive inflammation, but this was also followed by disastrous results. All of these methods have been

abandoned, and it remains to mention those used more or less at present.

Among those methods used at present, in civilized countries may be mentioned the truss; injections around the sac; invagination; subcutaneous operations, and the direct method.

The truss will undoubtedly effect a cure in some instances, especially if the hernia is in young children, or if it has recently occurred, but the percentage of cures does not seem to be over 10 per cent. And often we meet with cases which cannot be supported by a truss, or in which a truss cannot be worn by the individual. The manufacturers state that when once a truss is worn, it is, as a rule, worn till death.

*Injections* of astringent or irritating substances were advocated by Velpeau 50 years ago. Since that time they have been practiced by Heaton, Warren, Bull, Janney and DeGarmo, of America, and in England by Mr. Keetly and others. The operation is said to be free from danger, and cures in rather more than half the cases in which it is tried, but it is only adapted to small hernias.

*Invagination*.—Gerdy invaginated the integument and sac with the finger, and then passed two double silk ligatures transversely through the pillars of the ring and invaginated portion, the ends of which he tied over pieces of catheter. Signorini used a catheter to invaginate and then transfix with three long pins, over which he passed figure of eight ligatures. Wutzer invaginates with a cylindrical plug, through the centre of which pass one or more long curved needles which make their exit through the abdominal integument above the internal ring. Agnew invaginates the sac, after having made an incision through the integument, then passes a suture through the apex of the invaginated portion which emerges through the abdominal integument so as to retain the sac in the canal. After this he closes the external ring by sutures. Little danger follows the various methods of invagination, but the cures are permanent in only a very few cases.

*Subcutaneous Operations*.—Prof. Dowell, of Texas, united the pillars subcutaneously, and claims to have cured 60 out of 100 cases operated on. Mr. Spanton, of England, uses a cork-screw-

like instrument, the distal spirals of which are larger than the proximal, so that when it is introduced, through the incision, and made to transfix the pillars of the ring, the opening is closed as the instrument is advanced. This is left for one week to set up inflammation, after which it is removed. He has operated on 60 cases without a death, and claims many cures. Mr. John Wood, of London, has had more experience with the radical cure of hernia than any living man, having operated 414 times, 370 of which were for inguinal. The mortality by his method was a little less than 2 per cent. and the cures were about 73 per cent. His method consists, essentially, in ligating the sac subcutaneously, while at the same time the pillars are drawn together.

None of these methods, in my estimation, fulfil all the requirements for the radical cure of hernia.

In the healthy individual, we find the parietal peritoneum perfectly smooth, with no pouches or pocketings, and this is firmly supported by the abdominal parieties, the inguinal canal being closed in a valvular way; and this is what we must try to bring about when we undertake its cure—*i. e.* obliterate the sac, flush with the parietal peritoneum, and close the inguinal canal. This is what is aimed at in the direct method.

*The Direct Method* consists in cutting down on the sac, under careful antiseptic precautions, removing or obliterating the sac, and closing the hernial opening. This application of Listerism seems to have been first employed by Mr. Chas. Steel, of Bristol, England, through Dr. J. O. Marcey, of Boston, first published cases in October, 1871. That the direct method gives more cures than any other method is not to be questioned, for in studying the cases reported by various operators I find that at least 90 per cent. of those operated on are cured, and I think that in future we can safely look for better results. It now remains to look at the mortality. This of course varies according as the hernia is strangulated, adherent to sac, accompanied by omentum and whether large or small. It is also affected by the health of the patient, the duration of the operation, and subsequent diseases.

In the following table I have placed only cases of reducible hernia.

OPERATION.	WHERE REPORTED.	No. Operations.	Deaths.
Mr. Jno. Wood, London.	British Med. Jour., June, 1885.	16	1
Dr. J. O. Marcey, Boston.	Jr. Am. Med. Asso., May, 1887.	30	0
Dr. W. M. Banks*, Liverpool.	British Med. Jour., Dec., 1887.	52	2
Dr. Wm. Macewen, Glasgow	British Med. Jour., Dec., 1887.	49	0
Mr. C. B. Ball, England.	British Med. Jour., Dec., 1887.	22	0
Mr. W. Y. Stoker, Ireland.	British Med. Jour., Dec., 1887.	3	0
Mr. K. Franks, Dublin.	British Med. Jour., Dec., 1887.	24	0
Mr. A. E. Baker, Ireland.	British Med. Jour., Dec., 1887.	35	0
Mr. A. W. M. Robson, † Eng.	British Med. Jour., Dec., 1887.	11	1
Dr. Ward Cousins, England.	British Med. Jour., Dec., 1887.	50	0
Mr. Wheeler, England.	British Med. Jour., Dec., 1887.	13	0
Dr. A. Rabagliate, England.	British Med. Jour., Dec., 1887.	1	0
Dr. A. W. Austin, U.S.M.H.S.	Annual Report, 1887.	2	0
Dr. W. H. Long, U.S.M.H.S.	Annual Report, 1887.	3	0
Dr. T. W. Kay, Beyrouth.	Not Reported.	7	0
		318	4

I will now proceed to drescribe the operation.

The patient having been prepared for the operation, the parts must be shaved, well washed with soap and water, and then with a solution of the bichloride of mercury. Hands, instruments, and sponges are disinfected in a solution of carbolic acid. The incision two or more inches in length, is made over the external ring, and parallel to the inguinal canal. The neck of the hernial sac must then be carefully separated from the cord and vessels, and also well separated from the walls of the canal, up as far as the parietal peritoneum. If the contents of the sac cannot be returned, it must be opened and, if gut, dissected loose and returned, or, if omentum, ligated and cut away. The neck of the sack should now be well drawn down and stitched across with gut, by the shoemakers stitch, as described by Marcey, of Boston. By some, it is simply ligated, and Ball, of England recommends twisting it. If the hernia is small, the sac should then be cut across, just below the suture and the lower end left in the scrotum. But if large, it will be well to follow the advice of Macewen in dissecting the sac out, plaiting it upon itself in its long axis, by means of a gut thread, and inserting it across the opening, next

\*One, a small child died from shock after a prolonged operation to separate the gut from adherent sac.

†Died from ether bronchitis.

the peritoneum, so as to act as a barrier. Having thus treated the sac, it remains to attend to the inguinal canal. In most cases, it is no longer a canal, but only an opening, the valvular arrangement having been lost from the pressure of the hernia, so it is only necessary to bring the pillars together by several interrupted sutures, and, as a rule, the more the better, for they excite inflammation. Should the valvular arrangement be present, one cannot do better than to follow Macewen in passing a suture by means of a curved needle, through the conjoint tendon, from without in, and then through the conjoint tendon, a little higher up, from within out, thus piercing it at two points. The two free ends of the suture are then carried through the external pillar, so that when tied the external pillar rests on the outer side of the conjoint tendon. As material for sutures, silk, catgut, wire and kangaroo-tendon are used. Catgut is unreliable, being too readily absorbed, and may give way before adhesion has taken place. Both silk and wire are liable to set up irritation by their presence in the tissues. Kangaroo-tendon is, in my estimation, the most reliable material for sutures that we have, not being readily absorbed, and causing very little irritation by its presence. In finishing the operation, all bleeding points must be secured, either by torsion or gut ligatures ; the wound cleansed and washed out with the bichloride solution, strength 1-1000 ; a few pieces of catgut or a small tube put in for drainage ; the cutaneous wound closed by silk sutures, and then dressed with iodoform and antiseptic cotton, a compress and bandage being put over the whole. In one of my cases, a large scrotal abscess made its appearance, and in this same case, in which I used catgut, the sutures gave way on the fourth day, after violent coughing. Wearing a truss for a few months after I considered a wise precaution, though, by no means, necessary. Any curved needle will do for the operation, but I considered such as used in vesico-vaginal fistulæ the best.

NOTE.—Since the publication of the above the author has operated on four more cases making a series of eleven. In only one was there any untoward result. See "Report of a Radical Cure of Hernia with Encysted Hydrocele followed by Pericaecal Abscess. —*Cleveland Medical Gazette*, June 1888."



